

What Is Claimed Is:

1. A vision inspection apparatus using total reflection mirrors comprising:
 - a board position control module for fixing a printed circuit board, on which components are mounted, on a suitable inspection position;
 - 5 an independent lighting unit installed at a just upper part of the board position control module and provided with a primary lighting for primarily illuminating the printed circuit board;
 - a photographing position control module, installed at a just upper part of the independent lighting unit, for changing a reflection angle by attaching the
 - 10 total reflection mirrors on axes of X-Y axis motors to required location coordinates on the printed circuit board;
 - a camera for obtaining images of the printed circuit board reflected from the photographing position control module;
 - a control unit including a motion controller for controlling the
 - 15 photographing position control module and the board position control module, a lighting controller for controlling an operation of the independent lighting unit, and an image processor for controlling an operation of the camera and converting the image entered to the camera into digital data; and
 - a vision processing unit for reading the image obtained through the
 - 20 camera and judging whether the image is good or bad.
2. The vision inspection apparatus using total reflection mirrors according to claim 1, wherein the board position control module is a conveyor structure including a board fixture provided with first and second detecting sensors for
- 25 detecting a flow and a position of the printed circuit board and a stopper for forcefully stopping the printed circuit board by detected values.
3. The vision inspection apparatus using total reflection mirrors according to claim 1, wherein the board fixture forms inclined slopes at its one end and the
- 30 other end to be located at a higher location than the conveyors of

preceding/following apparatuses.

4. The vision inspection apparatus using total reflection mirrors according to claim 1, wherein the independent lighting unit arranges and installs a primary
5 lighting around a periphery of a visual passageway passing through a center thereof to illuminate the printed circuit board at all directions.
5. The vision inspection apparatus using total reflection mirrors according to claim 1, wherein the independent lighting unit is closely installed at a just upper
10 part of the board position control module.
6. A vision inspection apparatus using total reflection mirrors comprising:
 - a board position control module for fixing a printed circuit board on a suitable inspection position;
 - 15 an independent lighting unit installed at a just upper part of the board position control module and provided with a primary lighting for primarily illuminating the printed circuit board;
 - a photographing position control module, installed at a just upper part of the dependent lighting unit, for changing an incidence angle and a reflection
20 angle by attaching the total reflection mirrors on axes of X-Y axis motors for performing a photographing and an illumination on required location coordinates;
 - a dependent lighting unit provided with a half reflection mirror for changing an illuminating position on the printed circuit board depending upon
25 the photographing position as the photographing position control module is moved, reflecting light illuminated from a secondary lighting to the photographing position control module, and penetrating an image of the printed circuit board;
 - a camera for obtaining images of the printed circuit board penetrated
30 from the half reflection mirror;

a control unit including a motion controller for controlling the photographing position control module and the board position control module, a lighting controller for controlling an operation of the independent lighting unit, and an image processor for controlling an operation of the camera and
5 converting the image entered to the camera into digital data; and

a vision processing unit for reading the image obtained through the camera and judging whether the image is good or bad.

7. A vision inspection method using total reflection mirrors, the method
10 comprising the steps of:

fixing a printed circuit board on a suitable inspection position with a board position control module;

illuminating the printed circuit board with an independent lighting unit;

adjusting an incidence angle and a reflection angle with the total
15 reflection mirrors attached on axes of X-Y axis motors in order to transmit an image of the printed circuit board to a camera;

converting the image entered to the camera into digital data; and

reading the image obtained through the camera and judging whether
mounted components are good or bad.

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8. A vision inspection method using total reflection mirrors, the method comprising the steps of:

fixing a printed circuit board on a suitable inspection position with a board position control module;

25 primarily illuminating the printed circuit board with an independent lighting unit;

illuminating light of a secondary lighting reflected by a half reflection mirror of a dependent lighting unit on required location coordinates of the printed circuit board, and adjusting an incidence angle and a reflection angle with the
30 total reflection mirrors attached on axes of X-Y axis motors in order to transmit

an image of the printed circuit board to the camera;
converting the image penetrated from the half reflection mirror of
the dependent lighting unit and entered to the camera into digital data; and
reading the image obtained through the camera and judging whether
5 mounted components are good or bad.

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